Please amend the claims as follows:

1. (twice amended) A composite material, [characterized in that it]which comprises two or more components of which one is super-porous polysaccharide (main component) which outside the superpores contains a gel phase with micro-pores and the other component(s) (secondary component(s)) are different from the main component with exception of the case that the composite contains an electrically monolithic secondary component which is intended to be, or is[,] connected between two electrodes.

2. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein the main component is in the shape of discrete particles or a continuous structure.

3. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is outside the super-pores but inside the main component's gel phase.

4. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is in the super-pores of the main components.

5. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is present in both the super-pores and in the gel phase of the main component.

6. (twice amended) The composite [according to]of claim 1, [characterized in that]wherein it has at least one affinity ligand.

7. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein the respective affinity ligand is linked to the main component and/or to one or more secondary components.

8. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein at least one of the affinity ligands is linked to the main component.

9. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein at least one of the affinity ligands is connected to one of the secondary components.

10. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein said at least one of the affinity ligands is an ion exchange group, amphoteric group, chelating group, bio affine group, a group which can bc used in covalent chromatography, a group which gives π-interaction, a group which can

be used during hydrophobic interactions chromatography, a group which give thiophilic interactions, or an affinity binding inorganic material which is a secondary component[, such as hydroxyapatite].

11. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein the secondary components are porous with average pore diameters which are greater than the average pore diameters in the gel phase of the main component.

12. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein it is in the shape of fibres, beads, or a monolith[, such as a membrane or a bed].

17. (once amended) [A]In a method for the chemical synthesis of a polymer [such as an oligonucleotide or an oligopeptide]on a solid phase, [characterized in that]wherein said synthesis includes the binding of said polymer to said solid phase, wherein the improvement comprises using, as the solid phase, [is]the composite material which is defined in [Claim]claim 1.

18. (once amended) [A]In a method for performing enzymatic/catalytic reactions in a bio-reactor, which method requires binding said enzyme or catalyst[characterized in that the enzyme and/or catalyst used is bound] to a composite material, the

improvement comprising using the composite material of claim[which is defined in Claim] 1.

19. (once amended) [A]In a method for culturing of cells, which method includes culturing said cells on a valid support, [characterized in that the cells are cultured on the composite material which is defined in]the improvement comprising using as said solid support, the composite material of [the Claim]claim 1.

Remarks

Claims 1–30 are pending in the captioned application. Applicants have elected to prosecute claims 1–19. Claims 20–30 are withdrawn from consideration. Applicants stand ready to cancel the unelected claims upon receipt of Notice of Allowance of the elected claims. Applicants have also cancelled claims 13-16, without prejudice and have amended claims 1–12 and 17-19 in response to the Examiner's rejection. A version of the claims marked up to show the amendments, as well as a clean version of the claims encompassing the amendments, is attached hereto as required.

Applicants gratefully acknowledge the courtesy as extended by Examiner Hai Vo in the granting of a personal interview with Applicants' representative, Royal N. Ronning, Jr. on October 25, 2002. The issues raised during that interview will be discussed herein.

The Examiner has required restriction under 35 U.S.C. § 121 and 372 to one of the following groups:

Group I, claim(s) 1-19, drawn to a composite material;

Group II, claim(s) 20-30, drawn to a separation method of using a composite material.

The Examiner states, "the inventions listed as Groups I-II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: claim I is obvious over WO 93/19115 (see rejections below). As the recited structure does not make a contribution over the prior art, unity of invention is lacking and restriction is appropriate."

During a telephone conversation with Applicants' undersigned representative, Applicants provisionally elected to prosecute the invention of Group 1, namely claims 1–19, with traverse. Applicants confirm this election, and withdraw the traversal except to the extent that Applicants do not concede that claim 1 is obvious over WO 93/19115. The reasons for this are discussed below in Applicants' response to the art rejections. Further, Applicants accept the restriction to advance prosecution only, and not because they accept the Examiner's contention that "the recited structure does not make a contribution over the prior art." The acceptance is for administrative convenience only

and should not be construed to be an acceptance of the Examiner's reasoning behind the restriction requirement.

The Examiner has objected to claims 1–19 because of the following informalities: "the phrase 'characterized in that' should be changed to -- wherein -- or -- comprising --. In claim 1, line 7, the ',' after 'is' should be deleted. In claim 18, line 2, the term 'a' needs to changed to -- the --. Appropriate correction is required."

In response, Applicants have amended the claims to delete the language to which the Examiner has objected. In view of the foregoing, the Examiner's rejections cannot be sustained and should be withdrawn.

The Examiner has rejected claims 10 and 12–19 under 35 U.S.C. § 112, second paragraph as, "as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Regarding claims 10, 12, 14, and 17, the phrase 'such as' renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention."

The Applicants have amended claims 17–19, and cancelled claims 13–16, without prejudice. The amendments include reciting positive steps for the process, and as such, Applicants believe comply with 35 U.S.C. § 112.

In view of the foregoing, Applicants respectfully assert the Examiner's rejections cannot be sustained and should be withdrawn.

The Examiner has rejected claims 13–19 under 35 U.S.C. § 101 because, "the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process."

In view of the amendments and cancellation of claims discussed above, Applicants believe that the Examiner's rejections cannot be sustained and should be withdrawn.

The Examiner has rejected claims 1–19 under 35 U.S.C. § 103(a) as being unpatentable over WO 93/19115 in view of Lihme et al (US 5,866,006)." Specifically, the Examiner states, "WO'115 teaches a porous polysaccharide having a net work of two continuous phases, an aqueous polysaccharide phase and an organic phase, wherein the aqueous polysaccharide phase includes small diameter pores which are interconnected to give flow passages through the gel, and the organic phase is the superpore-forming phase comprising large diameter flow through pores."

The Examiner concedes, "WO'115 does not specially disclose the super-porous polysaccharide containing the gel phase with micropores outside the superpores. However, the pore arrangement would inherently be present since the WO'115 is using the same materials and the same mixing technique to prepare the porous material as

Applicant. WO'115 is silent as to the secondary component of the composite material. Lihme discloses a conglomerate and the use of the conglomerate as a carrier or substrate material in a chromatographic procedures."

The Examiner continues, "it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a conglomerate as the secondary component of the porous material in WO'115 motivated by the desire to maximize the chromatographic performance of the super-porous material because the elasticity, mechanical strength, pore sizes and biocompatibility of the conglomerate can be controlled independently of the density."

In response, Applicants respectfully assert that the Examiner has misunderstood the instant invention, and disclosure of the cited references. Specifically, while Applicants concede, as the Examiner pointed out during the above referenced interview, that WO 93/19115 may contain gel outside the superpores, Applicants respectfully submit that it is neither disclosed nor even suggested that a **composite** material as claimed in the instant application can be manufactured in either of the references. More specifically, as disclosed in the references, the emulsification of superporous polysaccharides occurs within a relatively narrow window of properties such as density, viscosity and hydrophilicity. It is also known, that addition of other materials to the polysaccharide (to form composites) can change these properties and disturb the emulsification. However, the instant invention shows that, quite unexpectedly that such

composites can be manufactured with desirable properties. Such is neither disclosed nor even suggested in the references the Examiner has cited.

Further, Applicants respectfully direct the Examiner's attention to the examples which demonstrate that suitable composite materials can be made. The Examiner's attention is also directed to the Background of Inventions section of the captioned application, especially page 1, lines 20–37, which discuss the problems with the prior art in obtaining suitable composite materials. Thus, Applicants respectfully assert that it would not have been obvious to combine the teachings of the Lihme reference with that of the WO'115 patent, since there would be no expectation of success in obtain suitable composite materials, given the difficulty in the art. At best, Applicants respectfully assert the Examiner has shown that it is "obvious to try" to perform such composite materials, however, such is not the appropriate basis for an obviousness rejection.

In view of the foregoing, Applicants respectfully submit the Examiner's rejections cannot be sustained and should be withdrawn.

Likewise, in view of the discussion above, Applicants respectfully assert that the Examiner's rejections of claims 6–8, 10, 11, 12, 13 and 14–19, in light of the same references cannot be sustained and should be withdrawn.

The Examiner has rejected claims 1–16 under 35 U.S.C. § 103(a) as, "being unpatentable over WO 93/19115 in view of Schaeffer et al (US 4,111,838)." The Examiner continues, "WO'115 teaches a porous polysaccharide having a net work of two continuous phases, an aqueous polysaccharide phase and an organic phase, wherein the aqueous polysaccharide phase includes small diameter pores which are interconnected to give flow passages through the gel, and the organic phase is the superpore-forming phase comprising large diameter flow through pores." The Examiner concedes, "WO'115 does not specially disclose the super-porous polysaccharide containing the gel phase with micropores outside the superpores. However, the pore arrangement would inherently be present since the WO'115 is using the same materials and the same mixing technique to prepare the porous material as Applicant. WO'115 is silent as to the secondary component of the composite material. Schaeffer discloses a chromatographic material comprising an inorganic support-polysaccharide particle matrix. The matrix comprises an inorganic support that has a high surface density of hydroxyl groups and covalently attached to polysaccharide particles."

The Examiner concludes, "it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ an inorganic support as taught in Schaeffer as the secondary component of the porous material in WO'115 motivated by the desire to obtain a chromatographic material that provides columns with high flow rates and high degree of purification."

In response, Applicants reiterate the arguments as to the inappropriateness of the rejection based on the '115 disclosure (and Lihme, et al.). Applicants respectfully assert that the addition of the Schaeffer patent does nothing to remedy these deficiencies.

In view of the foregoing, Applicants respectfully assert the Examiner's rejections cannot be sustained and should be withdrawn.

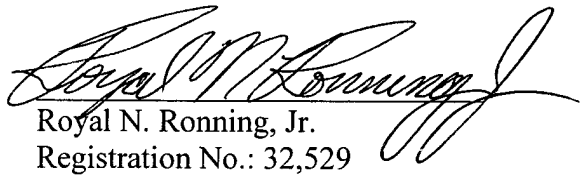
The Examiner has rejected claims 1–16 and 18 under 35 U.S.C. § 103(a) as, "being unpatentable over WO 93/19115 in view of Manganaro et al (US 5,155,144)." Specifically, the Examiner cites the WO'115 reference for the same reasons cited above and states," WO'115 is silent as to the secondary component of the composite material. Manganaro discloses a microporous sheet containing a selective-binding matrix formed from polyvinyl chloride beads and polysaccharide."

In response, Applicants reiterate the arguments raise above, and respectfully assert that the addition of the Manganaro reference does not remedy the deficiency of the WO'115 reference.

In view of the foregoing, Applicants respectfully assert the Examiner's rejections cannot be sustained and should be withdrawn.

In view of the foregoing, Applicants respectfully assert that the Examiner's rejections cannot be sustained and should be withdrawn. Applicants believe the claims, as amended are in allowable form and earnestly solicit the allowance of claims 1–12 and 17–19.

Respectfully submitted,



Royal N. Ronning, Jr.
Registration No.: 32,529
Attorney for Applicants

Amersham Biosciences Corp
800 Centennial Avenue
P. O. Box 1327
Piscataway, New Jersey 08855-1327

Tel: (732) 457-8423
Fax: (732) 457-8463

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on 20Dec02.

Melissa Leck
Signature
Date December 20, 2002

H:\DEPT\Law_Dept\IP Dept\Response to Office Action\PL\PL9824 (12-20-02).doc

Claims (marked-up version showing amendments)

1. (twice amended) A composite material, [characterized in that it]which comprises two or more components of which one is super-porous polysaccharide (main component) which outside the superpores contains a gel phase with micro-pores and the other component(s) (secondary component(s)) are different from the main component with exception of the case that the composite contains an electrically monolithic secondary component which is intended to be, or is[,] connected between two electrodes.

2. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein the main component is in the shape of discrete particles or a continuous structure.

3. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is outside the super-pores but inside the main component's gel phase.

4. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is in the super-pores of the main components.

5. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein at least one of the secondary components is present in both the super-pores and in the gel phase of the main component.

6. (twice amended) The composite [according to]of claim 1, [characterized in that]wherein it has at least one affinity ligand.

7. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein the respective affinity ligand is linked to the main component and/or to one or more secondary components.

8. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein at least one of the affinity ligands is linked to the main component.

9. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein at least one of the affinity ligands is connected to one of the secondary components.

10. (twice amended) The composite material [according to]of claim 6, [characterized in that]wherein said at least one of the affinity ligands is an ion exchange group, amphoteric group, chelating group, bio affine group, a group which can bc used in covalent chromatography, a group which gives π-interaction, a group which can

be used during hydrophobic interactions chromatography, a group which give thiophilic interactions, or an affinity binding inorganic material which is a secondary component[, such as hydroxyapatite].

11. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein the secondary components are porous with average pore diameters which are greater than the average pore diameters in the gel phase of the main component.

12. (twice amended) The composite material [according to]of claim 1, [characterized in that]wherein it is in the shape of fibres, beads, or a monolith[, such as a membrane or a bed].

17. (once amended) [A]In a method for the chemical synthesis of a polymer [such as an oligonucleotide or an oligopeptide]on a solid phase, [characterized in that]wherein said synthesis includes the binding of said polymer to said solid phase, wherein the improvement comprises using, as the solid phase, [is]the composite material which is defined in [Claim]claim 1.

18. (once amended) [A]In a method for performing enzymatic/catalytic reactions in a bio-reactor, which method requires binding said enzyme or catalyst[characterized in that the enzyme and/or catalyst used is bound] to a composite material, the

improvement comprising using the composite material of claim[which is defined in Claim] 1.

19. (once amended) [A]In a method for culturing of cells, which method includes culturing said cells on a valid support, [characterized in that the cells are cultured on the composite material which is defined in]the improvement comprising using as said solid support, the composite material of [the Claim]claim 1.

Claims (clean version encompassing amendments)

1. (twice amended) A composite material, which comprises two or more components of which one is super-porous polysaccharide (main component) which outside the superpores contains a gel phase with micro-pores and the other component(s) (secondary component(s)) are different from the main component with exception of the case that the composite contains an electrically monolithic secondary component which is intended to be, or is connected between two electrodes.

2. (twice amended) The composite material of claim 1, wherein the main component is in the shape of discrete particles or a continuous structure.

3. (twice amended) The composite material of claim 1, wherein at least one of the secondary components is outside the super-pores but inside the main component's gel phase.

4. (twice amended) The composite material of claim 1, wherein at least one of the secondary components is in the super-pores of the main components.

5. (twice amended) The composite material of claim 1, wherein at least one of the secondary components is present in both the super-pores and in the gel phase of the main component.

6. (twice amended) The composite of claim 1, wherein it has at least one affinity ligand.

7. (twice amended) The composite material of claim 6, wherein the respective affinity ligand is linked to the main component and/or to one or more secondary components.

8. (twice amended) The composite material of claim 6, wherein at least one of the affinity ligands is linked to the main component.

9. (twice amended) The composite material of claim 6, wherein at least one of the affinity ligands is connected to one of the secondary components.

10. (twice amended) The composite material of claim 6, wherein said at least one of the affinity ligands is an ion exchange group, amphoteric group, chelating group, bio affine group, a group which can bc used in covalent chromatography, a group which gives π-interaction, a group which can be used during hydrophobic interactions chromatography, a group which give thiophilic interactions, or an affinity binding inorganic material which is a secondary component.

11. (twice amended) The composite material of claim 1, wherein the secondary components are porous with average pore diameters which are greater than the average pore diameters in the gel phase of the main component.

12. (twice amended) The composite material of claim 1, wherein it is in the shape of fibres, beads, or a monolith

17. (once amended) In a method for the chemical synthesis of a polymer on a solid phase, wherein said synthesis includes the binding of said polymer to said solid phase, wherein the improvement comprises using, as the solid phase, the composite material which is defined in claim 1.

18. (once amended) In a method for performing enzymatic/catalytic reactions in a bio-reactor, which method requires binding said enzyme or catalyst to a composite material, the improvement comprising using the composite material of claim 1.

19. (once amended) In a method for culturing of cells, which method includes culturing said cells on a valid support, the improvement comprising using as said solid support, the composite material of claim 1.